CLAIMS

1. An electronic device having a structure of an ohmic connection to a carbon element cylindrical structure body, wherein a metal material is positioned inside the junction part of a carbon element cylindrical structure body joined to a connection objective and the carbon element cylindrical structure body and the connection objective are connected by an ohmic contact.

2. The electronic device as claimed in claim 1, wherein said metal material is Ni, Fe or Co, or an alloy containing at least one of Ni, Fe and Co.

3. The electronic device as claimed in claim 1, wherein the material of said connection objective is Ti, Nb, Si or C.

4. The electronic device as claimed in claim 1, wherein said connection objective is a part of the wiring in an electronic device.

5. The electronic device as claimed in claim 1, wherein said carbon element cylindrical structure body is a carbon nanotube.

6. A method for producing an electronic device having a structure of ohmic connection to a carbon element cylindrical structure body, comprising disposing a metal material on a connection objective capable of ohmically contacting a carbon element cylindrical structure body and forming a carbon element cylindrical structure body by chemical vapor deposition using said metal material as the catalyst while accomplishing an ohmic contact between the carbon element cylindrical structure body and the connection objective.

7. The method for producing an electronic device as claimed in claim 6, wherein the material of said connection objective is alloyed with said metal material by the elevation of temperature during said chemical vapor deposition and a carbon element cylindrical structure body is grown using the particle of said metal material in said alloy as the catalyst for said chemical

vapor deposition.

8. The method for producing an electronic device as claimed in claim 6, wherein the material of said connection objective is Ti, Nb, Si or C.

9. The method for producing an electronic device as claimed in claim 6, wherein said metal material is Ni, Fe or Co, or an alloy containing at least one of Ni, Fe and Co.

10. The method for producing an electronic device as claimed in claim 6, wherein said chemical vapor deposition is performed by applying an electric field in the growth direction of the carbon element cylindrical structure body.

11. The method for producing an electronic device as claimed in claim 6, wherein said carbon element cylindrical structure body is a carbon nanotube.

12. A method for producing an electronic device having a structure of ohmic connection to a carbon element cylindrical structure body, comprising forming a first stack of a first material capable of ohmically contacting a carbon element cylindrical structure body and a second material of catalyst metal disposed on said first material, heat-treating said first stack in vacuum or in a hydrogen atmosphere to form a second stack made of a lower layer composed of an alloy of the first material and the second material, an intermediate layer composed of the first material and an upper layer composed of a fine particle of the second material, and forming a carbon element cylindrical structure body by chemical vapor deposition using the fine particle of the second material on the surface of said second stack as the catalyst to incorporate the fine particle of the second material into the inside of the carbon element cylindrical structure body and at the same time, connect, by ohmic contact, the side wall of the carbon element cylindrical structure body to the intermediate layer composed of the first material.

13. The method for producing an electronic device as claimed in claim 12, wherein said first material is Ti, Nb, Si or C.

14. The method for producing an electronic device as claimed in claim 12, wherein said second material is Ni, Fe or Co, or an alloy containing at least one of Ni, Fe and Co.

15. The method for producing an electronic device as claimed in claim 12, wherein said chemical vapor deposition is performed by applying an electric field in the growth direction of the carbon element cylindrical structure body.

16. The method for producing an electronic device as claimed in claim 12, wherein said carbon element cylindrical body is a carbon nanotube.

17. A method for growing a carbon nanotube, comprising disposing a substrate in a growth chamber, supplying a starting material gas to the chamber, and orientation-growing a carbon nanotube on the substrate by CVD, wherein the growth of the carbon nanotube uses neither an electric field nor a plasma but uses heat generated from a filament disposed in the growth chamber.

18. The method for growing a carbon nanotube as claimed in claim 17, wherein the temperature of said filament during the growth of the carbon nanotube is 400°C or more.

19. The method for growing a carbon nanotube as claimed in claim 17, wherein said filament is a filament made of rhenium or a material mainly comprising rhenium.

20. The method for growing a carbon nanotube as claimed in claim 17, wherein said starting material gas is a gas of a carbon source.

21. The method for growing a carbon nanotube as claimed in claim 20, wherein said carbon source is a hydrocarbon, an alcohol or a mixture thereof.

22. The method for growing a carbon nanotube as claimed in claim 21, wherein said hydrocarbon is methane,

ethane, acetylene, propane, butane or a mixture of two or more thereof.

23. The method for growing a carbon nanotube as claimed in claim 21, wherein said alcohol is methanol, ethanol or a mixture thereof.

24. The method for growing a carbon nanotube as claimed in claim 20, wherein said starting material gas further contains one or both of a reactive gas and an inert gas.

25. The method for growing a carbon nanotube as claimed in claim 24, wherein said reactive gas is hydrogen.

26. The method for growing a carbon nanotube as claimed in claim 24, wherein said inert gas is helium or argon.

27. The method for growing a carbon nanotube as claimed in claim 17, wherein the total pressure of said starting material gas in the growth chamber is 0.1 to 100 kPa.

28. The method for growing a carbon nanotube as claimed in claim 17, wherein a thin film-like or fine particle-like carbon nanotube growth catalyst formed on the substrate surface is used.

29. The method for growing a carbon nanotube as claimed in claim 28, wherein said fine particle-like catalyst is used as said catalyst and the diameter of the growing carbon nanotube is controlled by the diameter of said fine particle-like catalyst.

30. The method for growing a carbon nanotube as claimed in claim 29, wherein said fine particle-like catalyst formed on said substrate is annealed in the growth chamber and in the presence of a reactive gas to remove impurities from the fine particle-like catalyst before the growth of the carbon nanotube.

31. The method for growing a carbon nanotube as claimed in claim 28, wherein said catalyst is a transition metal Fe, Ni, Co or Pd capable of acting as

the catalyst for the growth of the carbon nanotube, or an alloy of two or more thereof.

32. The method for growing a carbon nanotube as claimed in claim 28, wherein said catalyst is an alloy of a transition metal capable of acting as the catalyst for the growth of the carbon nanotube and a metal which does not act as the catalyst.

33. The method for growing a carbon nanotube as claimed in claim 32, wherein said alloy is an Fe-Pt or Co-Pt alloy.

34. The method for growing a carbon nanotube as claimed in claim 17, wherein during the growth of carbon nanotubes, one or both of said filament and said substrate are moved relatively.

35. The method for growing a carbon nanotube as claimed in claim 17, wherein said substrate is a semiconductor or glass substrate.

36. The method for growing a carbon nanotube as claimed in claim 17, wherein the growth face temperature of said substrate during the growth of the carbon nanotube is 600°C or less.